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ABSTRACT

A 3-year project focused on problems related to teaching reading in content areas in secondary schools. The project was sponsored by the United States Office of Education and supported 10 doctoral students in their doctoral studies, eight interns, a graduate assistant, and a research student. Six interrelated doctoral dissertations were completed and are available from ERIC/ERIC. The dissertations focused on two broad areas: (1) how to prepare students for the reading of specific subject matter materials and (2) how to guide students' reading and reasoning so they are learning process as well as content. Their main concerns were prereading activities, development and testing of cognitive organizers, guided reading and development of guide materials, intraclass grouping, vocabulary development, a comprehension model, and a research model. A monograph, *Research in Reading in the Content Areas: First Year Report*, was also developed. The author reports here the background, the method used, and the significant findings of the project. He also reports on the means used to disseminate the findings and makes recommendations for future efforts. References are included. (AW)

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CENTERS TO TRAIN SECONDARY SCHOOL READING CONSULTANTS
IN PROGRAMS FOR TEACHING READING IN
SUBJECT AREAS

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U. S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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INTRODUCTION

Summary

A three-year project focused on problems related to teaching reading in content areas in secondary schools. Six interrelated doctoral dissertations have been completed and are available from ERIC/CRIER. The authors are: Robert Baker (1971); Richard Barron (1971); Richard Earle (1970); Thomas Estes (1970); David Honeycutt (1971); Judie Thelen (1970). A monograph, also available through ERIC/CRIER, reports on part of the project: Research in Reading in the Content Areas: First Year Report, Syracuse University, 1970.

Two additional monographs will be produced during the 1971-72 academic year and made available through ERIC. Four more dissertations will be completed during the 1971-72 school year, by doctoral students supported by the project during its last two years of operation. These also will be available through ERIC. The authors will be: Heather Campbell; Richard Cunningham; Frances Hatch; Scott Shablak. The studies completed were directed primarily toward 1) ways to prepare students for reading specific content-area materials and 2) ways to guide students while they read so as to improve their comprehension and post-reading reasoning skills.

Variations of cognitive organizers were developed and tested. Ways to teach and reinforce technical vocabulary were tested as were ways to set purpose for reading.

Guide materials were developed to simulate the comprehension process. These were used with students to direct their response to content-area resources, both print and film. The influence of small group interaction was examined. Ways to make both student-student interaction and teacher-student interaction also were studied to increase their contribution to skill development and understanding of the subjects.

Though findings from these studies were equivocal, they are potentially productive in the pursuit of ways to improve students' reading achievement. Sufficiently substantial findings support the establishment of additional research projects to pursue these promising leads. A consortium - for this purpose - is recommended.

Findings from these studies were used with teachers in schools. Teacher response indicates there is practicality in the product of the project. This response also suggest the enormous potential in this type of reading instruction - both for increasing students reading achievement and for providing useful variety in teaching the content of various subjects.

Background

Reading programs in secondary schools frequently are inappropriate to the needs of students. Relatively few students - or teachers - actually participate in the program. This is because reading instruction is provided mainly by reading teachers in reading classes - whether remedial, corrective, or developmental. Consequently, most students in junior and senior high schools do not receive beneficial reading instruction beyond the sixth grade.

This condition exists for several reasons. In spite of admonitions expressed to subject area teachers regarding the advisability, practicality, and responsibility for teaching reading as part of their curriculum, few subject area teachers provide such instruction. This is because, in the main, they have not been taught how - either in preservice or inservice professional courses. Practical assistance has not kept pace with the admonitions.

Another reason for this condition is that thinking about reading instruction is influenced largely by personnel with elementary school orientation. At the elementary level, reading is treated as a separate subject and rarely becomes incorporated in a formal way into the curriculums of the various subjects. Since this thinking predominates the field, one finds reading taught as a separate subject in secondary schools. However, because of departmentalization and specialization, reading instruction is provided by reading teachers in separate reading classes. And because of the logistics of scheduling and required courses, relatively few students have the opportunity to participate in these reading courses. So a very high percent of time and money devoted to reading instruction in secondary schools is expended for a very small percent of the student population.

A third reason for this condition is that reading personnel usually found in secondary schools are not prepared to work with subject-area teachers in developing an instructional

program that will reach every student in every classroom and give him the reading instruction he needs. The reading teachers themselves, need to learn how to adapt instructional procedures found successful in reading classes to the special restrictions and requirements of the subject-area classrooms.

Clearly, then, a positive response is needed to rectify these conditions that limit the value of reading instruction in secondary schools. Research is needed to identify methods and materials that will increase students' reading proficiency and knowledge of subject matter. These methods and materials must be applicable in the regular classroom by the subject area teacher. Training programs are needed: for teachers, to show them how to apply the methods and materials found useful through the research; for reading personnel, to show them how to aid the subject area teachers as they apply the methods and materials. Demonstration of such instruction is needed, then, so teachers from other communities can see such instruction being provided.

This project was based on these three purposes: research, training, demonstration. It extended over three years, March 1968 - June 1971. The activities, products, and findings are the subject of this report.

Methods:

This project supported a total of ten doctoral students in their doctoral studies; eight interns, a graduate assistant and a research assistant. Some were supported for their entire program. Others, either because of their previous study or because they entered the project in its second year, were supported for only a part of their total academic program. At the time of the official conclusion of the project, June 30, 1971, three participants had received their Ph.D. degrees; by July 15, a fourth was awarded his Ph.D.; by August 13, two more received their degrees. The remaining four participants will complete their studies and receive their degrees during the 1971-72 academic year.

The research efforts of these 10 students were directed toward the development of base data on specific problems related to reading instruction in subject area classes. To the extent possible, the studies conducted by individuals were interrelated: findings from one were fed into another for corroboration or comparison or variation. This was true both for short-term "mini-studies" and for long-range dissertation studies.

The studies were conducted in schools, giving students opportunities to participate in and direct staff development programs. They taught subject area teachers how to teach reading through the content of their courses. The students had other opportunities to engage in staff development programs. Personnel in schools other than those in which studies were being conducted requested help in finding ways to meet their students' reading needs. Such requests were responded to affirmatively and the students had opportunity to practice their consulting skills as they worked with these faculties.

Students learned ways to work with secondary school teachers as they sought to establish appropriate reading instruction. Subsequently they had opportunity to pass along these consulting skills as they worked with reading personnel in schools and helped them work with subject area teachers.

FINDINGS AND ANALYSIS

Significant research findings

The major findings of the project are contained in the six dissertations and the one research monograph produced thus far in this project. These should be read by anyone interested in opportunities related to teaching reading in content areas in secondary schools.

The research focused on two broad areas: 1) how to prepare students for the reading of specific subject matter material; 2) how to guide students' reading and reasoning so they were learning process as well as content. Studies examined either or both of these areas.

Underlying the studies was a concern about research methodology, and attempts were made in pilot studies and main studies to apply some new techniques.

Basic to all of the studies and the search for appropriate research methodology, were two questions: 1) Are there practical methods and materials that will allow a regular classroom teacher of a regular secondary school content area, to make teaching how to read the resources for his subject a regular part of his curriculum, so that the content of the course and the processes by which that content is acquired are taught simultaneously. 2) Is it possible to conduct research in regular educational (classroom) settings so the results are reliable and the process respectable.

In brief, then, the studies were directed toward and/or found the following

pre-reading activities: Considerable interest was given to Ausubel's ideas for organizing students' prior knowledge and making it a means for acquiring new knowledge. A variation of Mr. Ausubel's "Advance Organizer" was developed by Barron and Earle, called a "Structured Overview." This was merely a presentation of key terms from the text to be read, by the teacher, prior to the reading, with the terms arranged on the board in some diagrammatic form so the interrelationships among those terms were clearly demonstrated. Terms from previous learnings also were incorporated, to show relationships. The "Structured Overview" provided a framework into which new knowledge could be fitted

Barron (1971), Earle (1970), and Baker (1971) all used this "Structured Overview" as part of their studies. Barron developed a system for teaching vocabulary within a content area(biology) and the structured overview was part of the system. Earle tested the viability of the structured overview in teaching mathematics. Baker incorporated a variation of the structured overview in his study of ways to improve students' reading of social studies material.

Findings from the studies generally indicate that the structured overview contributes importantly to students' acquisition of new vocabulary and understanding of course content.

Thelen (1970) did not use the structured overview but, rather, incorporated Ausubel's original idea of Advance Organizers as part of her study in Earth Science.

Guided Reading: "How can we guide students' reading so they understand both content and process?" is a question often asked. In an effort to guide students' reading skill development, questions are asked which presume prior facility with the skill presumably being taught. This activity, then, is testing rather than teaching or guiding.

Research efforts in this project examined the development and use of a variety of applications of guide materials, based primarily on Herber's (1970) concept of three levels of comprehension.

Estes (1971) and Thelen (1970) used such guides in the development of students reading skills in World History

and Earth Science, respectively. Baker (1971) used modifications of the original type of guide in World History. Whereas Estes and Baker were guiding students' reading of texts, Thelen guided their reading of films.

Barron (1971) used a type of guide in his study of vocabulary development. Three types of paper-pencil reinforcement exercise material contributed to significant development of word meanings in the field of biology. These exercises were modifications of those developed earlier by Herber (1964).

Findings regarding the use of guides are equivocal. There is strong indication that guides which attempt to simulate the processes being taught, are useful in developing students' competence with those processes. More research is needed to verify these indications.

Intra-class Grouping: The studies by Estes (1970), Thelen (1970), and Barron (1971), utilized small-group discussions as part of their research design. In all cases, students were assigned to small groups for the purpose of discussing their individual responses to the guide material (discussed above) which had been previously completed.

Though the findings were equivocal regarding the value of group discussion, a trend did emerge and some specific recommendations can be made with confidence. Barron's concept of "expanded directions" was a valuable contribution, outlining ways to make certain that the tasks students were to perform in and for the small group discussions, were clearly understood. Subsequently, he also operationally defined teacher-led discussion that incorporated the advantages of student-student interaction with student-teacher interaction in full class discussion. As a result, there is strong indication that teachers have two effective means for promoting valuable discussion, both based on the use of guide materials. This will allow more variety in discussions and reinforcing experiences in a teacher's instructional repertoire.

Comprehension Model: Over several years of experimental application in subject area classrooms, Herber (1970) developed an approach to guiding students' reading comprehension of materials required in these subjects. The methods and instructional materials were based on the view that comprehension is a three-part construct. One reads, as it were, at three successive levels of compre-

hension, the literal; the interpretive; the applied. Guide materials (discussed above) were designed to reflect this construct.

Honeycutt's dissertation (1971) explored this construct, comparing it to other models of comprehension, to operational definitions of comprehension (standardized test) and to Bloom's Taxonomy of Educational Objectives - Cognitive Domain to determine consistency with the hierarchical relationship of the levels of comprehension.

Honeycutt's study indicates that the Levels of Comprehension model includes processes contained in standardized tests and also goes beyond to more abstract types. Also, there was consistency in hierarchical ordering of the levels.

How to design guides so they reflect the levels of comprehension and, particularly, so they are useful in teaching students how to read materials in subject-area classes, is not so clear. Further research is needed, but Barron's concept of expanded directions is a promising direction to take.

Research Model: Krathwohl (1968) refers to "iterative" studies as a promising practice in research. Barron used this procedure in his own three-phase study as did Baker in his two-phase study. Barron suggests a research model based on this concept, a model that is easily adopted by classroom teachers as well as university-based researchers.

He suggests an organizational scheme for conducting research that has great promise for rapidly expanding our knowledge base in reading improvement.

Analysis of problems: One of the values of a project is to note the problems that emerge in its conduct. The significant problems in this project were related to 1) time; 2) money; 3) the combining of research and demonstration in the same project.

Time: The project was approved and funding was to have begun in September 1967. Because of a national freeze on funds, the starting date was delayed until March 15, 1968. Having a project operate on a fiscal year within a setting that operates on an academic year caused particular problems at the beginning and end. It was virtually impossible to find students who could join the program when the academic year was nearly two-thirds over. So the project

could not begin in earnest until some months after it was initially funded. The opposite problem was experienced at the close of the project. Participants had one-third of the academic year remaining, yet the funding was stopped. An extension of the time for the project was granted, an important factor for incorporating the closing phases of several studies into the life-time of the project. However, as noted below, the extension of time did not solve the real problem.

Money: As explained in other reports, operating a project on a fixed budget but with an adjusted time schedule caused difficulties, particularly at the end of the project. There was no funding for the director or the participants from March 15, 1971 to the end of the academic year. Considerable ingenuity was required - in this year of tight money - to secure funds sufficient to cover students' stipends. This problem was compounded by the fact that the amount of the originally proposed budget had been accepted and adhered to while the basis for computing students' stipends was changed from a basic allotment per participant to also include a dependency allowance. Since this amount had not been included in the original budget, adjustments had to be made that would not have been necessary otherwise.

Combining research and demonstration: Doctoral dissertations have a way of becoming a consuming force. Much more is at stake than the findings of the research study. Personal and professional futures are also very much in the minds of the participants. Understandably, then, the predominance of time and attention is centered on those major studies and the sub-studies that contribute to them. The demonstration phase of the project received less emphasis. This experience suggests that research and demonstration should be kept separate or, at least, dissertation studies should not be part of the research if the two are to be combined. There is much that we now know that can be placed in schools and demonstrated to the profession. Other settings might better serve to promote research studies, feeding to demonstration centers the methods and materials to be made available to the profession.

Dissemination

Another useful product of a project is an analysis of the means for disseminating its findings. This project utilized several.

Publications: The first monograph, Research in Reading in the Content Areas - First Year Report, has been widely disseminated, both through ERIC/CRIER and through the Reading and Language Arts Center at Syracuse. Two additional monographs are being prepared and will appear during the 1971-72 academic year. Of course, the completed dissertations also are available through ERIC/CRIER and University Microfilms. Articles have appeared in the Journal of Reading that bear on the project and discuss applications of teaching processes either found or corroborated by the research.

Personnel: As already indicated, a considerable amount of dissemination is occurring through former participants who are becoming established in the Universities in which they are employed. Each has established a course entitled "Teaching Reading in Content Areas" through which they disseminate findings from this project and develop new understandings. Each is engaged in research that extends the findings of this project. Each is involved in staff development programs in local schools, passing along the knowledge they gained in this project and adding new information as a result of their own experiences. All are involved in advising Master's students, and several are advising doctoral students, in programs emphasizing reading instruction within the various content areas in secondary schools.

Professional organizations: There has been widespread interest in this project, coming from high school faculty groups, university personnel, and various professional organizations. More requests than could be accepted came to project participants, to present findings and practical applications of the research for these groups. The program participants sponsored a two-day seminar, along with Dr. Harry Singer and his EPDA project at U. C. at Riverside, in teaching reading in content areas at the IRA Convention in Atlantic City. Around 400 attended the sessions, and as a result, there have been many who have requested information for use in their own schools in order to set up local inservice workshops and seminars. Similarly, presentations regarding the project have been given at NCTE national conventions, at local IRA Council meetings, even at a series of workshops held by the state of Hawaii Education Department. Each has been followed by a flurry of interest and inquiry.

Reading Conferences: Two state-wide reading conferences on Teaching Reading In Content Areas, have been organized

by former participants in the program. Dr. Thomas Estes, University of Virginia, held one for that state during the month of March, 1971. It was well attended, well received, and has created considerable interest in this type of reading instruction. Dr. Richard Earle, Indiana University, has organized a similar state-wide conference. A similar response is anticipated.

Non-participant studies: An unanticipated - but logical - type of dissemination has occurred with respect to the findings from the research studies. The Reading and Language Arts Center at Syracuse has a large number of doctoral students in residence, supported by funds from the University or from outside sources. There is good communication among these students and application of research techniques and findings are encouraged. At least two doctoral dissertations, completed by students outside of this project, have drawn on procedures, methods, and materials found to be effective through this project. A third is in progress. Thus, the findings of this project are disseminated in an unusual way. The completed dissertations are available through University Microfilms:

Rnders, Peter Use of Change Procedures to Develop Comprehension Skill in the Intermediate Grades, Syracuse University, 1971.

Sanders, Peter An Investigation of the Effects of Instruction in the Interpretation of Literature on the Responses of Adolescents to Selected Short Stories, Syracuse University, 1970.

Spin-off activities: Fiscal necessity, mentioned above, did have its advantages. During the last half of the final year, activities related to the project were directed toward securing support for the participants against the time when the funding would cease March 15, 1971. The Research Assistant secured a small contract grant and his support was shifted to that. One of the interns served as an assistant on that project and received support after funding on this project ceased. Two interns were hired by a local school to establish a staff development program related to teaching reading in content areas (reported in the editorial of the May 1971 issue of Journal of Reading), so their stipends were continued. The same was true of the fourth intern: funds from a local school for staff development programs extended his stipend beyond the March 15, 1971 end-of-funding.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

This project generated several important products:

Dissertation studies: As discussed in the previous section, this project produced six interrelated studies on problems related to reading instruction in secondary schools. The project demonstrated the value of having several individuals work cooperatively on a given research problem to generate base data and follow-up replications for refinement. It also demonstrated that some adjustment is necessary to avoid conflict between personal goals related to doctoral study and larger professional goals of service to schools and demonstration to the profession. Perhaps a one-year post-doctorate internship would allow a combination between demonstration and research. The interns could carry the weight of concern regarding demonstration while masters and doctoral students concentrate on the research problems under the direction of the interns.

In any case, this project produced valuable base data indicating directions for future research. These leads should be followed up with additional research and demonstration projects.

Contribution to professional literature: Through the first monograph from the project and the dissertations discussed above, there has been an important contribution to the literature related to reading instruction in content areas in secondary schools. Given the paucity of research literature on this aspect of reading improvement, the reports of these studies make the project valuable.

It is expected that the second and third monographs - to be filed subsequent to this report - will be equally valuable. Also anticipated are a series of articles produced by the former participants in the project, as they report on the research they conducted for - and subsequent to - their dissertations.

Contributions to professional leadership: The six participants who received their Ph.D.'s through the project all have appointments on university faculties: Richard Earle at Indiana University; David Honeycutt at University of Buffalo; Judith Thelen at Frostburg State College; Robert Baker at Illinois State University, Normal, Illinois;

Thomas Estes at University of Virginia; Richard Barron at Oakland University. Already they are serving in important positions: Associate Director of ERIC/CRIER; Advisory Board for the Journal of Reading; Co-director of the COMPASS project on reading improvement in content areas; Associate Director of a TTT program. Through these positions and based on their interest in and commitment to teaching reading in content areas, these graduates of the project are, and will be, providing important leadership in the profession. It is anticipated that the four remaining participants will similarly serve.

Exploration of a unique field: Though much has been written about the need for teaching reading in content areas in secondary schools and the need for staff development programs that can lead to such instruction, relatively few studies have been conducted and relatively few programs have been established. The research findings from this project, then, represent an exploration into an important - and unique - field. In like manner, schools in which instructional programs of this type have been started serve as examples of what can be accomplished in schools. The uniqueness of the project that fostered this instruction is thus highlighted.

Work in schools: In spite of problems related to combining research and demonstration as discussed above, the work in schools still was useful. Teachers with whom the interns worked found that the help was practical and helpful to their students' reading performance. These teachers, then, influenced others in their schools to the extent that there were observable changes in teaching strategies and learning behaviors.

Recommendations

Persons interested in reading instruction in subject areas should secure copies of the monographs and dissertations. All are available through ERIC/CRIER. There is much data to pursue in replication studies or to stimulate additional studies. Ideally, a consortium of interested personnel from several universities should conduct a wide ranging series of related studies to pursue the several avenues of potential aid to students and teachers revealed by this project. Hopefully, USOE will encourage - and the general economy will allow - such an effort.

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